



Coye Inc

Attorney Docket
No. P0316

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of :

Harold Gene Havard, Jr.
Steven Schneider
Eric M. Perez

Assignee:

Lennox Manufacturing Inc.

Patent No.: 6,945,320 B2

Serial No.: 10/764,666

Issued: September 20, 2005

Filed: January 26, 2004

For: Tubular Heat Exchanger With
Offset Interior Dimples

Certificate
OCT 07 2005
of Correction

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 CFR 1.322

Pursuant to 37 CFR 1.322, Lennox Manufacturing Inc., assignee of record herein, files this request for correction of an Office mistake in the above-identified United States Patent. In support of this request, assignee submits the following.

On the cover page of the Patent, the last name of the first named inventor, Harold Gene Havard, Jr., is misspelled. Specifically, his last name is shown as "Harvard" instead of "Havard". See attached copy of the cover page of the Patent, with the misspelled last name (two occurrences) circled in red.

All documents in the file history of the Patent, including all correspondence received from the Office up to this time, have shown Mr. Havard's last name with the correct spelling. For example, enclosed herewith are copies of the Issue Notification dated August 31, 2005 and the Notice of Allowance dated May 18, 2005, in which Mr. Havard's last name is correctly spelled. Therefore, it is believed that the error occurred during the printing of the Patent and was due to an Office mistake.

OCT 11 2005

Accordingly, it is requested that a Certificate of Correction be issued, correcting the spelling of the first named inventor's last name in both occurrences on the cover page of the Patent, as follows:

In the upper left corner of the cover page, change "Harvard, Jr. et al." to – Havard, Jr. et al. – .

In the list of inventors on the cover page, change "Harold Gene Harvard" to – Harold Gene Havard – .

No fee should be due in view of the fact that the error is believed to be an Office mistake.

Respectfully submitted,



W. Kirk McCord
Attorney for Assignee
Reg. No. 29,192

P. O. Box 799900
Dallas, Texas 75379-9900
(972) 497-5196

OCT 11 2005



CERTIFICATE OF MAILING (37 C.F.R. §1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Lisa R. Hardin
(Typed name of person mailing paper)

Date: September 30, 2005

Lisa R. Hardin

OCT 11 2005



US006945320B2

(12) **United States Patent**
Harvard, Jr. et al.

(10) **Patent No.:** **US 6,945,320 B2**
 (45) **Date of Patent:** **Sep. 20, 2005**

(54) **TUBULAR HEAT EXCHANGER WITH
 OFFSET INTERIOR DIMPLES**

(75) Inventors: **Harold Gene Harvard, Jr.**, Terrell, TX
 (US); **Steven Schneider**, Plano, TX
 (US); **Eric M. Perez**, Lake Dallas, TX
 (US)

(73) Assignee: **Lennox Manufacturing Inc.**,
 Richardson, TX (US)

(*) Notice: Subject to any disclaimer, the term of this
 patent is extended or adjusted under 35
 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **10/764,666**

(22) Filed: **Jan. 26, 2004**

(65) **Prior Publication Data**

US 2005/0161209 A1 Jul. 28, 2005

(51) Int. Cl.⁷ **F28F 13/12**

(52) U.S. Cl. **165/109.1; 165/177; 126/110 R**

(58) Field of Search **165/108-184;
 126/110**

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,991,788 A * 2/1935 Catter 138/38

2,591,235 A * 4/1952 Cartter 126/91 A
 3,232,280 A * 2/1966 Loebel 122/149
 5,094,224 A * 3/1992 Diesch 126/110 R
 5,375,654 A * 12/1994 Hougland et al. 165/109.1
 5,839,505 A * 11/1998 Ludwig et al. 165/109.1
 6,289,982 B1 * 9/2001 Naji 165/177
 6,422,306 B1 * 7/2002 Tomlinson et al. 165/170
 6,453,989 B1 * 9/2002 Watanabe et al. 165/177
 2002/0005275 A1 * 1/2002 O'Donnell et al. 165/109.1
 2003/0029608 A1 * 2/2003 Shimoya 165/152

* cited by examiner

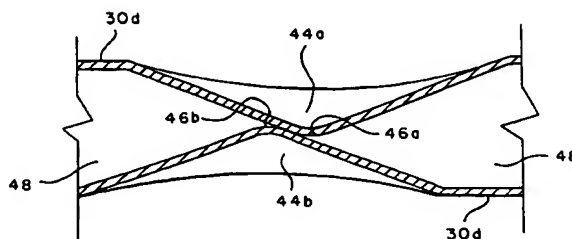
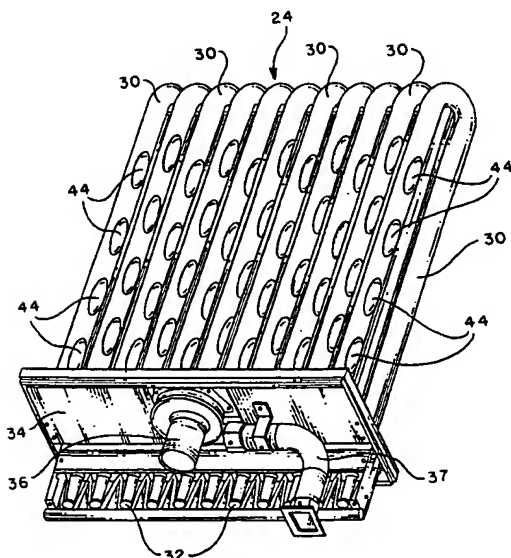
Primary Examiner—Allen J. Flanigan

(74) *Attorney, Agent, or Firm*—W. Kirk McCord

(57) **ABSTRACT**

A tubular heat exchanger has at least one pair of dimples which are extruded into at least one tube of the heat exchanger by deforming the tube wall inwardly. The dimples of each pair are in generally facing relationship, but are offset with respect to each other along a longitudinal axis of the tube, which slows down the flow of flue gas in the tube when the heat exchanger is in operation and increases the turbulence of the gas, thereby enhancing the transfer of heat from the flue gas to air flowing across the outer surfaces of the heat exchanger. The offset design allows each dimple to protrude beyond the centerline of the tube, which alters the direction of the flue gas flowing in the tube.

19 Claims, 4 Drawing Sheets



OCT 11 2005



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,666	09/20/2005	6945320	P0316	8796

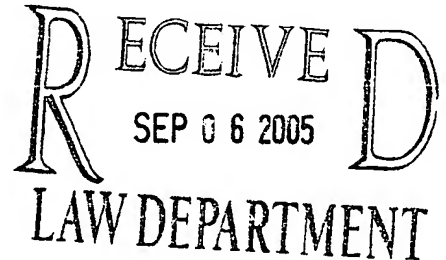
7590

08/31/2005

W. Kirk McCord, Esq.
Intellectual Property Counsel
Lennox International Inc.
P.O. Box 799900
Dallas, TX 75379-9900



ISSUE NOTIFICATION



The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

APPLICANT(s) (up to 18 names are included below, see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Harold Gene Havard JR., Terrell, TX;
Steven Schneider, Plano, TX;
Eric M. Perez, Lake Dallas, TX;





UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES
Patent and Trademark
Office
Address: COMPTON
P.O. Box 108
Alexandria, VA
www.uspto.gov

PERCE

NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

05/18/2005

EXAMINER

FLANIGAN, ALLEN J

ART UNIT

PAPER NUMBER

3753

DATE MAILED: 05/18/2005

Kirk McCord, Esq.
Intellectual Property Counsel
Lennox International Inc.
P. O. Box 799900
Dallas, TX 75379-9900

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,666	01/26/2004	Harold Gene Havard JR.	P0316	8796

TITLE OF INVENTION: TUBULAR HEAT EXCHANGER WITH OFFSET INTERIOR DIMPLES

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1400	\$300	\$1700	08/18/2005

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Notice of Allowability

Application No.

10/764,666

Applicant(s)

HAVARD ET AL.

Examiner

Allen J. Flanigan

Art Unit

3753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicants' response filed 5/3/2005.
2. ☒ The allowed claim(s) is/are 3-8, 11-16, 18-21 and 23-25.
3. ☒ The drawings filed on 1/26/2004 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


Allen J. Flanigan
Primary Examiner
Art Unit: 3753



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,666	01/26/2004	Harold Gene Havard JR.	P0316	8796

7590

05/18/2005

W. Kirk McCord, Esq.
Intellectual Property Counsel
Lennox International Inc.
P. O. Box 799900
Dallas, TX 75379-9900

EXAMINER

FLANIGAN, ALLEN J

ART UNIT

PAPER NUMBER

3753

DATE MAILED: 05/18/2005

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571) 272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.